AMENDMENTS

IN THE SPECIFICATION:

The paragraph under the heading "Cross Reference to Related Applications" has been amended to read as follows:

-- This application is a continuation-in-part of application 09/350,620, filed on July 7, 1999, now U.S. Pat. No. 6,117,366, which is a continuation-in-part of 09/335,257, filed on June 17, 1999, now U.S. Pat. No. 6,177,365. These parent applications are herein entirely incorporated by reference.--

The paragraph beginning under the heading "Field of the Invention" on page 1 has been amended to read as follows:

-- This invention relates generally to coated inflatable fabrics and more particularly concerns airbag cushions to which very low add-on amounts of coating have been applied and which exhibit extremely low air permeability. The inventive inflatable fabrics are primarily for use in automotive restraint cushions that require low permeability characteristics (such as side curtain airbags). Traditionally, heavy, and thus expensive, coatings of compounds such as neoprene, silicones and the like, have been utilized to provide such required low permeability. The inventive fabric utilizes an inexpensive, very thin coating to provide such necessarily low permeability levels. Thus, the inventive coated inflatable airbag possesses a coating comprising an elastomeric material (or materials) in contact with the target fabric wherein the elastomeric material possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. The coating is then applied to the airbag surface in an amount of at most 2.5 ounces per

square yard (and preferably forms a film). The inventive airbag exhibits a characteristic leak-down time (defined as the ratio of inflated bag volume to bag volumetric leakage rate at 10 psi) of at least 5 seconds after inflation. The resultant airbag cushions, particularly low permeability cushions exhibiting very low rolled packing volumes, are intended to reside within the scope of this invention.--

The paragraph beginning on the last line of page 7 has been amended to read as follows:

--Accordingly, this invention is directed to an airbag cushion comprising a coated fabric, wherein said fabric is coated with an elastomeric composition in an amount of at most 2.5 ounces per square yard of the fabric; and wherein said airbag cushion, after long-term storage, exhibits a characteristic leak-down time of at least 5 seconds. Also, this invention concerns an airbag cushion comprising a coated fabric, wherein said fabric is coated with an elastomeric composition; wherein said elastomeric composition comprises at least one elastomer possessing a tensile strength of at least 2,000 and an elongation of at least 180%; and wherein said airbag cushion, after long-term storage, exhibits a characteristics leak-down time of at least 5 seconds. Additionally, this invention encompasses a coated airbag cushion which exhibits a rolled packing volume factor (measured as the rolled diameter of the airbag cushion to depth of coverage measured from the attachment point of the target automobile's roofline to lowest point of coverage below the roofline after inflation) of at least 17.--

The paragraph beginning on line 18 of page 12 has been amended to read as follows:

--Of particular interest as the elastomer components within the inventive elastomeric compositions are, specifically, polyamides, polyurethanes, acrylic elastomers, hydrogenated nitrile rubbers (i.e., hydrogenated NBR), fluoroelastomers (i.e., fluoropolymers and copolymers containing fluoro-monomers), ethylene-vinylacetate copolymers, and ethylene acrylate copolymers. Also, such elastomers may or may not be cross-linked on the airbag surface. Preferably, the elastomer is a polyurethane and most preferably is a polycarbonate polyurethane elastomer. Such a compound is available from Bayer Corporation under the tradename IMPRANIL®, including IMPRANIL® 85 UD, ELH, and EHC-01. Other acceptable polyurethanes include BAYHYDROL® 123, also from Bayer; Ru 41-710, EX 51-550, and Ru 40-350, both from Stahl USA. Any polyurethane, or elastomer, for that matter, which exhibits the same tensile strength and elongation at break characteristics as noted above, however, are potentially available within the inventive coating formulation and thus on the inventive coated airbag cushion. In order to provide the desired leak-down times at long-term storage, however, the add-on weights of other available elastomers may be greater than others. However, the upper limit of 3.0 ounces per square yard should not be exceeded to meet this invention. The desired elastomers may be added in multiple layers if desired as long the required thickness for the overall coating is not exceeded. Alternatively, the multiple layer coating system may also be utilized as long as at least one elastomer possessing the desired tensile strength and elongation at break is utilized.--

The paragraph beginning on line 16 of page 13 has been amended to read as follows:

--Other possible components present within the elastomer coating composition are thickeners, antioxidants, antiblocking agents, crosslinking agents, surfactants, flame retardants, coalescent agents, adhesion promoters, and colorants. In accordance with the potentially preferred practices of the present invention, a dispersion (either solvent- or water-borne, depending on the selected elastomer) of finely divided elastomeric resin is compounded or a resin solution is compounded with a flame retardant to yield a compounded mix having a viscosity of about 8000 centipoise or greater. A polyurethane is potentially preferred, with a polycarbonate polyurethane, such as those noted above from Bayer and Stahl, most preferred. Other potential elastomeric resins include other polyurethanes, such as WITCOBOND™ 253 (35% solids), from Witco, and SANCURE®, from BFGoodrich, Cleveland, Ohio; hydrogenated NBR, such as CHEMISAT™ LCH-7335X (40% solids), from Goodyear Chemical, Akron, Ohio; EPDM, such as EP-603A rubber latex, from Lord Corporation, Erie, Pennsylvania; butyl rubber, such as Butyl rubber latex BL-100, from Lord Corporation; and acrylic rubber (elastomers), such as HYCAR™, from BFGoodrich. This list should not be understood as being all-inclusive, only exemplary of potential elastomers. Furthermore, the preferred elastomer will not include any silicone, due to the extremely low tensile strength (typically below about 1,500 psi) characteristics exhibited by such materials. However, in order to provide effective aging and non-blocking benefits, such components may be applied to the elastomeric composition as a topcoat as long as the add-on weight of the entire elastomer and topcoat does not exceed 2.5 ounces per square yard. Additionally, elastomers comprising polyester or polyether segments (such polypropylene oxide) or other similar components, are undesirable, particularly at very low add-on weights (i.e., 0.8-1.2 oz/yd^2) due to stability problems in heat and humidity aging

(polyesters easily hydrolyze in humidity and polyethers easily oxidize in heat); however, such elastomers may be utilized in higher add-on amounts as long, again, as the 2.5 ounces per square yard is not exceeded.--

The paragraph beginning on line 20 of page 14 has been amended to read as follows:

--Among the other additives particularly preferred within this elastomer composition are heat stabilizers, flame retardants, primer adhesives, and materials for protective topcoats. A potentially preferred thickener is marketed under the trade designation NATROSOL™ 250 HHXR by the Aqualon division of Hercules Corporation which is believed to have a place of business at Wilmington, Delaware. In order to meet Federal Motor Vehicle Safety Standard 302 flame retardant requirements for the automotive industry, a flame retardant is also preferably added to the compounded mix. One potentially preferred flame retardant is AMSPERSE® F/R 51 marketed by Amspec Chemical Corporation which is believed to have a place of business at Gloucester City New Jersey. Primer adhesives may be utilized to facilitate adhesion between the surface of the target fabric and the elastomer itself. Thus, although it is preferable for the elastomer to be the sole component of the entire elastomer composition in contact with the fabric surface, it is possible to utilize adhesion promoters, such as isocyanates, epoxies, functional silanes, and other such resins with adhesive properties, without deleteriously effecting the ability of the elastomer to provide the desired low permeability for the target airbag cushion. An adhesive primer coating may be applied directly to the fabric before applying the inventive high strength elastomeric coating to assure great adhesion strength.--

The paragraph beginning on line 11 of page 17 has been amended to read as follows:

--Two other tests which the specific coated airbag cushion must pass are the oven (heat) aging and humidity aging tests. Such tests also simulate the storage of an airbag fabric over a long period of time upon exposure at high temperatures and at relatively high humidities. These tests are actually used to analyze alterations of various different fabric properties after such a prolonged storage in a hot ventilated oven (>100°C) (with or without humid conditions) for 2 or more weeks. For the purposes of this invention, this test was used basically to analyze the air permeability of the coated side curtain airbag by measuring the characteristic leak-down time (as discussed above, in detail). The initially produced and stored inventive airbag cushion should exhibit a characteristic leak-down time of greater than about 5 seconds (upon re-inflation at 10 psi gas pressure after the bag had previously been inflated to a peak pressure above about 15 psi and allowed to fully deflate) under such harsh storage conditions. Since polyurethanes, the preferred elastomers in this invention, may be deleteriously affected by high heat and humidity (though not as deleteriously as certain polyester and polyether-containing elastomers), it may be prudent to add certain components within a topcoat layer and/or within the elastomer itself. Antioxidants, antidegradants, and metal deactivators may be utilized for this purpose. Examples include, and are not intended to be limited to, IRGANOX® 1010 and IRGANOX® 565, both available from CIBA Specialty Chemicals. This topcoat may also provide additional protection against aging and thus may include topcoat aging improvement materials, such as, and not limited to, polyamides, NBR rubbers, EPDM rubbers, and the like, as long as the elastomer composition (including the topcoat) does not exceed the 2.5 ounces per square yard (preferably much less than that, about 1.5 at the most) of the add-on weight to the target fabric.--

The paragraph beginning on line 15 of page 21 has been amended to read as follows:

--Recently, a move has been made away from both the multiple-piece side curtain airbags (which require great amounts of labor-intensive sewing to attached woven fabric blanks) and the traditionally produced one-piece woven cushions, to more specific one-piece woven fabrics which exhibit substantially reduced floats between woven yarns to substantially reduce the unbalanced shifting of yarns upon inflation, such as in Ser. No. 09/406,264, now U.S. Pat. No. 6,220,309, to Sollars, Jr., the specification of which is completely incorporated herein. These one-piece woven bags are generally produced on dobby or jacquard fluid-jet looms, preferably the utilized one-piece airbag is made from a jacquard weaving process. With such an improvement, the possibility of high leakage at seams is substantially reduced. These airbags provide balanced weave constructions at and around attachment points between two layers of fabrics such that the ability of the yarns to become displaced upon inflation at high pressures is reduced as compared with the standard one-piece woven airbags. Unfortunately, such inventive one-piece woven bags are still problematic in that the weave intersections may be displaced upon high pressure inflation such that leakage will still most likely occur at too high a rate for proper functioning. As a result, there is still a need to coat such one-piece woven structures with materials which reduce and/or eliminate such an effect. However, such one-piece woven structures permit extremely low add-on amounts of elastomeric coatings for low permeability effects. In fact, these inventive airbags function extremely well with low add-on coatings below 1.5 and as low as about 0.8 ounces per square yard.--